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A New Natural Language Processing-Based Essay Grading Algorithm

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Abstract: The evaluation of an English essay is one of the most significant and difficult activities that is manually carried out by knowledgeable and capable instructors and faculty members. The advancement of science and technology has made it possible to automatically evaluate an English essay by employing techniques pertaining to natural language processing. For any given English essay, the intelligent system provides a generic evaluation as well as the topic/question correlation. This evaluation is based on the NLP multiple neural network model, which was used to build the system. The evaluation of essays according to worldwide standards is the primary contribution of this innovation. Any worldwide grading system, such as the Graduate Record Examination, the International English Language Testing System, etc., is qualified to make use of the grading standard. The algorithm gives users the opportunity to test their knowledge on a range of criteria, from the most basic to the most complicated, that are included in the scoring of an English essay.

Keywords: Automatic evaluation, Natural Language Processing (NLP), General Assessment, And Topic/Question Correlation, Evaluation Method.

Introduction

Graduation Record Examination (GRE), International English Language Testing Systems (IELTS), etc., are growing in popularity since their scores are increasingly being accepted as admissions requirements at a wide range of colleges and employers [1]. The Graduate Record Examination (GRE) is a standardised test that serves as the groundwork for admission to graduate school at international institutions [2-5]. The Educational Testing Service (ETS) owns and manages the Graduate Record Examination (GRE), which attempts to assess candidates' abilities in verbal reasoning, numeric reasoning, analytical writing, and critical thinking [6]. As a result, more and more students are signing up to take the examinations, and there's a sizable cushion between now and when we need to start publishing the results of our assessments of their English essays [7-11]. English language proficiency in Europe, Canada, and Australia is often measured by the International English Language Testing System (IELTS), an international

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standardisation test [12]. The enormous number of applicants causes inconsistency in offering the evaluation service; hence, a proposed model is developed and put into action to automate the evaluation process and make it available as an API (Application Programming Interface) service [13-17].

A company that is in charge of standardised tests like the GRE, IELTS, etc., can devote considerable resources to advertising [18]. Meanwhile, a novel model called essay grader implements seven Natural Language Processing (NLP) strategies, each yielding a probabilistic outcome, and this analytical result-set is combined into five parametric models consisting of a scoring scheme ranging from 0 to 10 points, which are then used to evaluate the candidate's performance on the exam [19-22]. In order to make the grading system for these parametric models more clear and easy to grasp for the user, we have labelled each variable [23]. The User Experience (UX) in quality management is improved by this mapping pattern of NLP servers to user-understanding models [24-25].

The multiple Hidden Markov model's natural extension is the multinomial Hidden Markov model. To put it simply, an HMM is a type of statistical Markov model in which the represented system is believed to be a Markov process with hidden states [26]. Though its internal state is hidden from view, its output is entirely dependent on its outward appearance. There is a probability distribution over the set of outcomes for each state. In order to construct complicated models with sufficient unobservable states, HMM give a conceptual toolkit [27-32]. They form the backbone of numerous applications, including those used for gene mapping, profile searches, and the detection of regulatory sites. Bidirectional Neural Networks are recurrent neural networks in which the input result is reliant on the output result from the other network [33-37]. One RNN generates the two opposing neurons, one for forward states and one for reverse states. Due to the lack of interactions between the neurons in the two directions, BNN can be taught using the same algorithms as RNN [38]. During forward pass training, the forward and backward states are passed before the output neurons, while during reverse pass training, the output neurons are passed before the forward and backward states [39]. The weights are adjusted once two processes, forward and backward passes have been completed [40].

LSTMs are used because they can learn to bridge minimal time lags over 1000 discrete time steps by enforcing constant error flow through "constant error carrousels" (CECs) within special units, called cells; this is because the bidirectional neural network has a higher hit ratio in obstacles like vanishing error problems and time delays. Two major subfields of machine learning are supervised and unsupervised learning [41-47]. For instance, the k-means algorithm can be used to create hard clustering, which one of two techniques to clustering that make up unsupervised is learning. Conversely, the Gaussian Mixture Model can be used to create soft clusters [48-52]. The model uses a normal distribution to classify and cluster the data, with the mean determining the cluster's centre and the covariance providing an indication of the spread of the data. Each word in the word2vector model is independently embedded with a vector. However, the continuous bag of words accomplishes the same goal while using a larger number of words as input. Target word "corona" might be placed in the context of "virus" and "pandemic," for instance. With the ability to represent the CBOW architecture as a deep learning classification model, we can now use context words as input and attempt to predict the target word [53-61].

The primary use of the unsupervised, non-linear method known as t-SNE (T-Distributed Stochastic Neighbor Embedding) is in the realm of exploring and visualising high-dimensional data. This gives us a visual representation of data in high dimensional space [62-77]. Similarity measures between pairs of instances in high and low dimensions spaces are computed by the t-SNE algorithm. It then applies a cost function to try to find the sweet spot between these two metrics of similarity [78]. As one of the most crucial and time-consuming academic jobs, evaluating an English essay is typically performed manually by trained and competent faculty members [79]. Now that we have advanced enough in our understanding of how to analyse

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natural language, we can easily automate this evaluative process. Our project's goal is to analyse the English essay, allowing the organisation holding these examinations to concentrate on other examinations and students to practise free will while improving their writing skills [80]. The project serves as a smart system, constructed on many neural network models, that provides a standard score for each essay written in English [81-93].

Literature Survey

There have been a lot of earlier proposals similar to this one. Numerous authors have contributed to the development of this concept by publishing numerous academic works [94]. We'll talk about a few of the books and movies below. The model will serve the user well when auto-spell checking his essay or other text for the next appropriate term. Probability theory is at the heart of the model [95-99]. Let's say a user is typing a sentence; this model can offer suggestions for terms that work well with what they've already typed [100-101]. For the model's optimal training and prediction abilities, a massive corpus of texts is provided as input. Taking as input only the first n words of each phrase, a "n-gram" model uses those words to generate predictions about the rest of the sentence in order to produce meaningful sentences [102-111]. Our proposal can make use of this model, which improves sentence connectivity based on the training dataset [112-119]. However, it has many more potential uses, including auto-correct in various messaging apps, word suggestions depending on the sentence written, etc. In this way, we can avoid situations when we have to retype the same words over and over again, saving both time and effort. To use, we just need to select the suggested word and use it in our phrase [120]. The essay's sentences and overall quality can be judged in this way. So, it's a probabilistic model with high precision, provided it's trained on a high-quality dataset [121-125].

A stochastic function, rather than a hyperbolic activation function, is used to create the cheap LSTM. Gates will replace the complicated mathematics used by neural networks [126]. The LSTM's "gates" are the basic computational units, and they may choose which sequence elements are most crucial to keep and which can be discarded [127]. As it gathers information, it organises it into sequences and passes them along. The primary application of LSTM is in the creation of new words [128-131]. LSTM's primary function is to identify the most significant words in a given phrase. It then uses these keywords to create predictions about what the correct word will be. The sigmoid function is used in the LSTM's Gates. Since it makes use of the sigmoid function, rather than the tanh function, its values are strictly between 0 and 1, rather than between -1 and 1. Consequently, the sigmoid function might instruct the neural network to focus on more relevant information while disregarding less significant input [132-139]. An LSTM cell utilises three gates to control the flow of data. They ignore the input and output gates and the gate altogether. This is how the long short-term memory (LSTM) works to boost the performance of neural networks [140].

Its sole application was in the field of linguistics, where it was used to identify words in a text and place them in the appropriate grammatical category [141-145]. To classify the words into their component components, we'll use a three-layer perceptron layer with n inputs, where n is the number of words in the dataset. According to the previous experiment, while the computational cost of training the network is significantly higher than the n-gram model, the accuracy was 99.4% without over-fitting the data [146]. To achieve this precision, an elastic hidden perceptron layer was used. Context length is dynamic at every given word level in the tagging process. A backpropagation of error algorithm is used during the training procedure [147]. To ensure that the elastic neural tagger's connection weights remain consistent regardless of the input length, a new training approach has been adopted. The goal of the novel training approach is to arrive at the same subsets of connection weights for the neural taggers with brief inputs as are achieved from training these taggers directly [148-151]. Training the elastic neural tagger involves treating it as a perceptron that has evolved from a simpler version; steps are taken to increase the complexity of the model from within. In particular, training begins with the smallest perceptron possible. As a result of training, a new perspective is established through

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gradual improvement, and then trained once more [152-163]. This procedure of incremental expansion and training is repeated until a perceptron with the greatest (I, r) is constructed and taught. Consequently, we can see that the words from the dataset will be tested, and the words will be classified based on the kind of parts of speech, once the training process is complete [164].

When we talk about neural networks, we often refer to RNNs, which stands for "Recurrent Neural Network" and describes a type of neural network that can process data in both forward and reverse directions [165]. For both language modelling and text creation, NLP relies only on RNN. There are two main types of clusters, soft and hard, and they are both used in the clustering technique to classify the word component into specific grouping. A component can only ever belong to one of several "hard clusters," or binary categories. The K-means algorithm is used for clustering, where training datasets are fed into nodes iteratively [166]. There are cases where the K-means method is too thorough, and necessary parts are left out because they cannot be assigned to a single cluster. K-means is a method for computing the average distance between a central point and a set of data points. Integrating Word2vec with additional keywords to enhance semantic expression and subject relevance [167]. The keywords associated with each paper will each have their own distinct vector. In order to discover the relationship between the words and the themes, we need to identify a reference word and then employ the Word2Vec technique [168].

The optimal centroid is found at the point where the mean and standard deviation are both zero. As a result, k-means is used to find the centroid positions [169]. The EM value represents the centroid of a region with a high concentration of data points. Initial iterations involve calculating the Euclidean distance between a random collection of data points. One data point is chosen as the centroid based on the minimum distance between any two data points [170]. Using the RSS (residual sum of squares) value from each iteration, the centroid's coordinate is adjusted to incorporate new data points. The weighted K-means algorithm produces stunning results in terms of the number of clusters, but the standard K-means algorithm produces negligible results, as shown by experimental data [171]. In addition, the weighted K-means algorithm generates more refined semantic information and subject relevance to aid cluster splitting [172-174].

The primary benefit of this approach is that it simplifies the utilisation of massive datasets by letting them execute in lower-dimensional areas [175]. To lower the dimensionality of the data and profit from the topological preservation of information, they have concentrated on models based on spectral clustering and topological unsupervised learning, i.e. the t-SNE (Stochastic Neighbor Embedding). Data will be classified as "similar" or "dissimilar" once the t-SNE algorithm is learned. It's no surprise that this data is more malleable than the raw variety. Taking into account two parameters in a 2d graphical representation of multiple data points, these points are mapped and clustered with soft or hard clustering using the algorithms k- mean or gaussian mixture model; consequently, it is necessary to evaluate these clusters for relevance or degree of similarity using the normal distribution to scale the datapoint's value against the distribution curve [176]. Vector values denoting similarities are allocated from a conditional probability distribution to the data points with the greatest distribution and the smallest high dimensional Euclidean distance [177]. With the T-Sne algorithm, we estimate the similarity between word components by plotting them in a matrix based on the distance between dissimilar and similar data points, with the maximum similarity value located near the diagonal of the matrix [178]. This matrix is called a diagonal matrix because the highest similarity is one. This algorithm uses just two parameters to preserve cluster similarity, word covariance, and relevance when clustering data points in a low-dimensional graph. Multiple iterations are required to cluster the data points based on their similarity, which is implemented in a low-dimensional network. Each iteration of the procedure yields a matrix; this continues until the matrix value obtained from a high-dimensional graph is reached [179]. Similarity between data points is determined by mapping them onto a t-distribution curve graph in a low-dimensional space.

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The framework will be broken down into four types of writing: narrative, persuasive, descriptive, and expository. The use of first-person pronouns like "I," "she," "he," etc. is a defining characteristic of narrative. The goal of argumentative or persuasive writing is to persuade the reader to accept the author's point of view. In most cases, the differences between competing points of view are striking. An attempt is made to back up the author's claim with evidence, arguments, or quotes from authorities in the field. The purpose of descriptive writing is to create an image in the reader's mind of the scene or experience being described. It could be a person, a place, or even just the vibe of a particular area. To elaborate; to provide further explanation. Therefore, the primary goal of this type of writing is to educate the reader about a specific subject. Writing like this is typical of scholarly publications, guidebooks, and other specialised types of writing. Named Entity Recognition, Part of Speech tagging, and Sentence Parsing are used for this purpose. This strategy employs a rule-based evaluation method known as rubrics. Narrative essays are the most common type of assignment graded using the NAPLAN (National Assessment Program - Literacy and Numeracy) marking rubric. In the first stage, we use a Stanford NER Tool to count the amount of words in an essay. A narrative essay often follows a single point of view character and can be written in either the first or third person. The 10 criteria on the rubric are used to evaluate various aspects of a student's essay (figure 1).

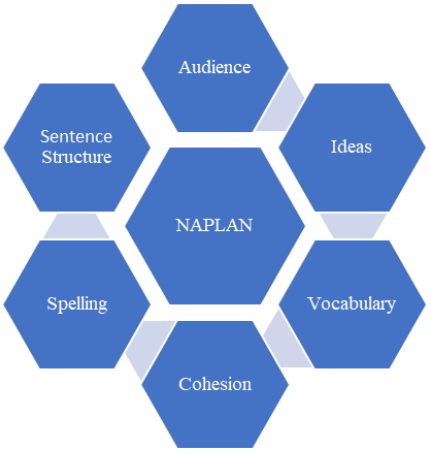

Figure 1: National Assessment Program - Literacy and Numeracy (few)

The NAPLAN grading rubric is used to determine an essay's final grade if it has been determined to be a narrative. The fact that it is so narrowly and rigidly focused on one subject is its biggest drawback. Although the techniques do for a distinct categorization of narrative essays, the genre categorization algorithms are not yet compiled into a single component, diminishing the proposed system's overall efficacy. One such system that takes into account linguistic aspects of the text is the E-rater. Several Natural Language Processing (NLP) methods are incorporated into the system to extract features from a database of example essays that will serve as the foundation for the grading algorithm. To simplify its analysis, E-rater considers that the characteristics of a good essay would not be significantly different from those of a similarly well-written essay, and vice versa for poor essays. To date, e-rater scores have been derived by a linear combination of high-level features computed for each essay, with weights set via regression of human evaluations on the features. The term "macro feature" is also used to describe these aspects. The values of these microfeatures are the result of a combination of a number of smaller, more specific features called macrofeatures. NLP is used to extract all of these macro and microfeatures. Common methods for predicting human performance typically involve 10 macro characteristics. Organization, progression, grammar, usage, mechanics, style, word length, word choice, collocation, preposition, and sentence variation are the 10 macro features we'll be looking at. When the scoring model is tailored to each query, these 10 macro factors are employed in conjunction with two word usage features unique to the prompt to forecast human scores. The E-rater V.2 scoring system is mostly unaltered from its predecessors, but it now makes use of a much smaller and more meaningful set of criteria, such as Style Measures and Lexical Complexity.

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When all of the essays' automated (e-rater) ratings have been tallied, ETS employs a set of evaluation criteria to determine the models' efficacy. There are performance standards that are applied to the independent assessment sample that is used to check the accuracy of the scoring models. A more generalizable measure of performance that is in line with what would be observed in future data would be the outcomes of the evaluation sample separate from the sample used to develop the model. Please consider the following as criteria: In general, automated scoring capabilities are built with preconceived notions and restrictions on the kind of assignments they will evaluate. Therefore, before implementing automated scoring, it is important to determine whether or not the capability's design is a good fit for the intended purposes of the assessment or other application. The procedure consists of a comparison between the construct of interest and the capability, a review of the task design, a review of the scoring rubric, a review of the human scoring criteria, a review of the goals for reporting scores, and a review of any claims or disclosures. Other system enhancements permit the development of a uniform scoring system. The 'Lexical Complexity' feature module, for example, takes into account word-based characteristics, keyword frequency, and word length, but it does not take into account the whole context in which the words are employed. Therefore, "nonsense text," which uses sophisticated language but adds nothing to the passage's meaning, can trick the feature.

Markit is an automatic Essay grading system proposed by Robert Williams and Heinz Dreher. Markit gets to work once an academic paper is fed through a variety of Natural Language Processing (NLP) methods in order to construct a corresponding proprietary knowledge representation. The student's grade is then calculated based on the percentage of correct information contained in the model response that was also present in their answer, using pattern matching techniques. The document's knowledge representation is constructed in part by mining an electronic version of Roget's Thesaurus for relevant linguistic data. The method relies on a semantic representation that can handle unbounded unseen text without requiring extensive hand coding of knowledge structures in advance. In the first step of processing a text, many Natural Language Processing (NLP) systems employ a parser to extract the sentence grammar. And then comes the semantic dissection. The literature is replete with recommendations for parsers based on Context-Free Phrase Structure Grammar (CFPSG). While useful in some situations, CFPSG parsing is limited to only the simplest of play settings. This is because it's really challenging to make sense of the free, invisible text. After all, a system that would need to analyse every conceivable parse tree generated would take too much time, and the required collection of grammar rules is already quite enormous. This article describes a prototype system that attempted CFPSG parsing, but ultimately gave up and relied on "Chunking" to identify the clauses and phrases that would be processed further. By employing grammatical heuristics, "chunking" makes it possible to rapidly infer noun phrases and verb sentences from uninitiated text. So, we can stop worrying about parsing times that are impossible to achieve. Roget's Thesaurus (Roget, 1991) data extraction is time-consuming since Visual Basic for Applications code must scan around 500 pages of a Microsoft Word document for each word in a sentence. One of the system's major drawbacks is that it can take up to 10 minutes to look up synonyms for a 40-word statement, and it needs to be tweaked in order to use a database version of Roget's Thesaurus.

3. System Design:

There are several moving parts in the essay-grading system architecture. All the modules are organised into 3 distinct layers in the architecture (figure 2):

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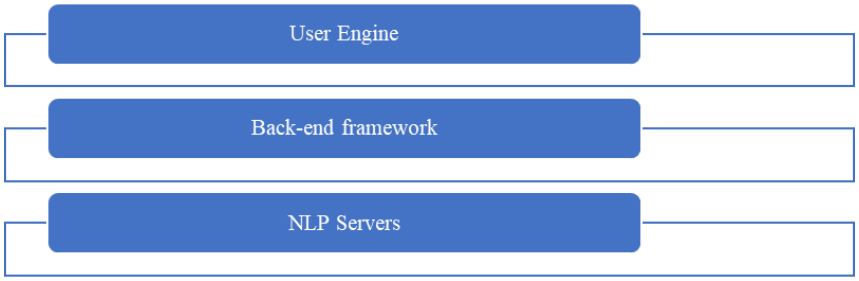

Figure 2: Architecture Categories

Internet-connected computers, laptops, smartphones, and other mobile devices make up the bulk of the user engine. The purpose of these gadgets is to provide users with intuitive interfaces that allow them to more simply and effectively interact with the platform and receive feedback on their essays. The gadgets connect to the API endpoint, where they query the server for the appropriate web page to display at the given URL. The requested web page will subsequently be sent back to your browser from these servers. The entire system is built as a Progressive Web Application (PWA), so it looks and feels much like a native app for iOS and Android. There are modules in the framework's back end that do things like classify the text and keep tabs on platform users. These are the modules (figure 3):

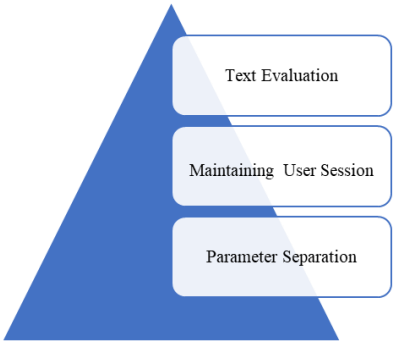

Figure 3: Back-end Framework

The central section of the English essay grader is called Text Evaluation. When this section is activated, the full essay is forwarded to the NLP Servers, where it is processed by a number of NLP algorithms and its resulting parameter values are returned. When a user enters in to our system, a session is created and kept alive until the user manually ends it. Similarly, this offers a single setting that allows it to save the session across all open browser tabs and windows. All of the NLP server's output is captured by the Text evaluation module, where it is then sorted into appropriate groups and the user's session and database are refreshed. The main assessment engine that grades the essay and returns the parameter score is housed in NLP servers. There are two primary modules on the NLP servers.

- NLP Model Bucket
- No-SQL Database

The NLP Model Bucket class provides all the necessary capabilities and methodology to assess the essay in light of these criteria (figure 4).

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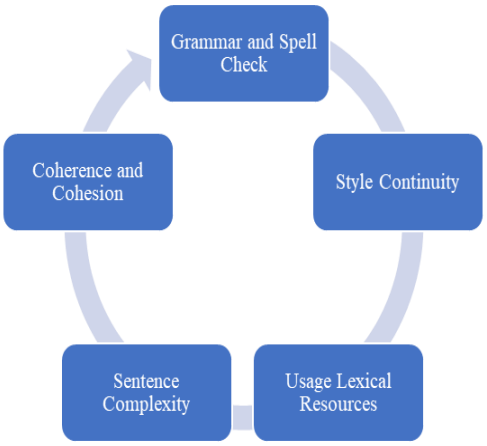

Figure 4: NLP Model Bucket

An essay's consistency in grammatical and spelling errors is checked by the grammar and spell check module. Sentence tokenization extracts sentences from the essay, and a module's evaluation of them yields a score between 0 and 10 on this metric. To determine the accuracy rate, we first determine whether or not the sentence is a perfect sentence by the sophistication of the sentence's composition is evaluated using the sentence complexity measure. Consider the two phrases "I know everything" and "No secret lies beyond my grasp" as an illustration. Sentence complexity is calculated and scored from 0 to 10 by this component. All the paragraphs in your essay should be written in the same English style. The third model considers whether the author maintains a consistent English dialect throughout the piece. A renowned writer in English will use a consistent accent when composing their phrases, making it easier for their readers to grasp what they're reading no matter where they are located. The reader will be thrown off if you use a mix of American English, British English, and Australian English in the same essay. We can achieve consistency via dictionary vector using the I-vector approach and Gaussian Mixture Model (GMM), and this method will work even with a small dictionary dataset. All parts of the essay will have the same weight in the final grade.

The skill level of the user is a criterion for this framework. A word's embedding, derived using Continuous bag-of-words (CBOW), is mapped to the bucket's appropriate word set based on the input word. There are five distinct containers, each corresponding to a distinct vocabulary requirement. Each of the five categories, labelled "buckets," contains a fuzzy vector value proportional to the level of difficulty of the words in that bucket. Word2vec, a word embedding system, calculates the cosine significance between the input corpus and a bag-of-words. The IBW (Intimacy between Words) algorithm takes the input word and the entire set of words and uses the intimacy percentage that is the highest to determine which bucket the input word belongs in. The frequency of occurrences of a mapped word is used to determine the vector value (TF). After a word's frequency vector is calculated, we use t-distributed Stochastic Neighboring to optimise the vector value for each back iteration of the training process. Because of its superior efficiency compared to other POS tagging algorithms, perceptron-based POS tagging is used to tag each noun POS (parts of speech) word in the sentence during model training. The model then assigns a score to the sentence based on where each word falls inside its network of semantic neighbours. Credits for lexical resources are calculated similarly by averaging the scores for numerous sentences.

Model 5 automatically pulls out sentences from an application essay as it is submitted. After that, an algorithm that recognises and codes letter strings is used to tokenize the sentences. The neural network will be trained to decipher the coded phrases. Coded words are passed as inputs to the sentence syntax analysis module, which indexes the words before applying any processing. The meaning of the statement is determined via a three-layer hamming neural network. The model has been trained to identify the most relevant subject word in a given sentence. As a result, we may learn what each line is actually about. To determine if there is any connection between the two topics of the adjacent sentences, we employ collaborative filtering and task-based

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knowledge approaches. This allows us to determine the overall cohesiveness of the essay.

System Implementation

This paper focuses on the logistics of putting the system architecture into action. To accomplish this, Python 3.8 was employed. Due to its intricate make-up, the model is run in a separate setting from the one in which the training and consumption algorithms are implemented. Using the react library, we were able to convert our app into a PWA. Django 3.0 is the web framework utilised. Django's RESTful API connects the front-end parts to Python's built-in classes and methods. Python is a high-level programming language that is interpreted, object-oriented, and has dynamic semantics. The combination of its high-level built-in data structures, dynamic typing, and dynamic binding makes it a compelling choice for Rapid Application Development and for usage as a scripting or glue language to connect preexisting components. Python's concise, easy-to-learn syntax places an emphasis on readability and decreases the cost of maintaining software. Python's module and package infrastructure promotes code modularity and reusability. Free and open source distribution of the Python interpreter and the entire standard library is possible on all major platforms. Our projects made use of a variety of packages, including but not limited to the following:

Django is an advanced Python web framework that facilitates the creation of reliable and easily maintained websites rapidly. Django was created by seasoned programmers to streamline and simplify web development, allowing us to focus on creating your project without having to invent the wheel. It's open source, free, and well-supported by both a large and helpful user community and extensive online resources. Because of Django, our application is comprehensive, flexible, safe, scalable, maintainable, and portable. The English dictionary WordNet contains a huge amount of information. Synsets are collections of cognate words that have a meaning but are otherwise dissimilar, including nouns, verbs, adjectives, and adverbs. Relationships between concepts and between words are used to connect synsets. At first glance, WordNet looks like a thesaurus since it organises words according to their meanings. There are, however, notable differences. The first thing to know is that WordNet connects not just letter strings but also meanings of words. Therefore, the semantic ambiguity between words that are physically close to one another in the network is resolved. In addition, WordNet provides labels for the semantic relations between words, whereas a thesaurus just groups words together based on their semantic similarity.

Experimental Results and Discussion

The results of our evaluations of our NLP models are discussed, along with the effects of the implementation and assessment metrics we utilised. The created models show an accuracy of 89.1%. Models of neural networks are built for each of the constraints used to judge essays in standardised tests of the English language. Each individual model dataset serves as input, therefore our models will function based on the aforementioned five parameters. Every single model achieves an efficiency of around 85%. When comparing the accuracy to prior works, there is a small variation. The above chart displays the varying degrees of accuracy achieved by various algorithms. The grammatical errors are generated by the Multinomial HMM (Hidden Markov Model), a probability-based classification model. Dictionary The quality of our n-gram model is entirely reliant on the data we used to train it. Data used to determine proper spelling is gathered from the aforementioned WordNet database. The Gaussian Mixture Model is a type of probabilistic clustering technique that assigns each datapoint a probability in relation to a random centroid. It's a way to categorise how advanced the vocabulary is that was used to construct the statement. Because of its generative nature, Bidirectional Neural Network can be applied to evolving data. The intricacy of the sentence varies from writing style to writing style, which is why we require dynamic data points. The scope and effectiveness of the project can be increased by making it available in multiple languages. As more information becomes available, we will be able to fully automate the grading of essays. Providing support for voice commands and evaluating speech also has significant implications for NLP.

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Conclusion

It takes a lot of time and effort for evaluators to go over and correct the answers. The testing facilities should also set aside some space for grading the submitted responses. All of this takes effort and additional resources to do. Our essay grader makes it easy for testing centres to administer these exams. Using this programme, grading and correcting responses is no longer a time-consuming manual process. We intend to create this programme so that institutions specialising in evaluating candidates' command of the English language, such as the IDP British Council, can use it to assess the candidate's command of the language as manifested in his written work (grammar, spelling, sentence structure, vocabulary, etc.). We took into account the limitations that assessors have when developing the programme. Neural networks play a pivotal role in the system's operation, and we've built custom networks to handle each type of operation. They're engaging in all four major modes of communication. In the future, we will be able to grade essays written in a variety of languages, including Tamil, Telugu, Malayalam, etc., all of which will be useful in the classroom. The candidate's performance in the speaking segment is currently assessed in real-time, as they speak. The candidate will be asked several questions by the Evaluator, and they must respond. In the near future, this can be done mechanically with the use of speech processing. The candidate's eloquence can be uncovered by recording the audio and applying ML algorithms to it. As a result, the product can benefit from a variety of ongoing and future works.

References

1. Khan, S. A., Reemiah Muneer. (2023). A Novel Thresholding for Prediction Analytics with Machine Learning Techniques. International Journal Of Computer Science And Network Security, 23(1), 33.
2. Khan, S., & AlAjmi, M. F. (2019). A Review on Security Concerns in Cloud Computing and their Solutions. International Journal of Computer Science Network Security, 19(2), 10.
3. Alfaifi, A. A., & Khan, S. G. (2022). Utilizing Data from Twitter to Explore the UX of “Madrasati” as a Saudi e-Learning Platform Compelled by the Pandemic. Arab Gulf Journal of Scientific Research, 39(3), 200-208.
4. Aryal, A., Stricklin, I., Behzadirad, M., Branch, D. W., Siddiqui, A., & Busani, T. (2022). High-Quality Dry Etching of LiNbO3 Assisted by Proton Substitution through H2-Plasma Surface Treatment. Nanomaterials, 12(16), 2836.
5. Paldi, Robynne L., Arjun Aryal, Mahmoud Behzadirad, Tito Busani, Aleem Siddiqui, and Haiyan Wang. "Nanocomposite-seeded Single-Domain Growth of Lithium Niobate Thin Films for Photonic Applications." In 2021 Conference on Lasers and Electro-Optics (CLEO), pp. 1-2. IEEE, 2021.
6. Shifat, A. Z., Stricklin, I., Chityala, R. K., Aryal, A., Esteves, G., Siddiqui, A., & Busani, T. (2023). Vertical Etching of Scandium Aluminum Nitride Thin Films Using TMAH Solution. Nanomaterials, 13(2), 274.
7. J. J. Patil, Y. H. Patil, A. Ghosh, “Comprehensive and analytical review on optical fiber refractive index sensor”, 2020 4th International Conference on Trends in Electronics and Informatics, (48184), IEEE, P. 169-175, 2020.
8. H. Bohra, A. Ghosh, “Design and analysis of microstrip low pass and band stop filters”, International Journal of Recent Technology and Engineering (IJRTE), Vol. 8, Issue 3, P. 6944-6951, Sept. 2019.
9. Y. H. Patil, A. Ghosh, “Optical fiber humidity sensors: a review”, 2020 4th International Conference on Trends in Electronics and Informatics (ICOEI) (48184), IEEE, P. 207-213, June. 15, 2020.

e-ISSN : 26203502
p-ISSN : 26153785

10. J. J. Patil, Y. H. Patil, A. Ghosh, "Fiber Optics Refractive Index Sensor based on Intensity Modulation", 2020 4th International Conference on Electronics, Communication and Aerospace Technology (ICECA), IEEE, P. 623-628, May. 2020.
11. H. Bohra, A. Ghosh, A. Bhaskar, A. Sharma, "A miniaturized notched band microstrip wideband filter with hybrid defected ground structure technique", 2020 Third International Conference on Smart Systems and Inventive Technology (ICSSIT), IEEE, P. 745-750, Aug. 2020.
12. Y. H. Patil, J. J. Patil, A. Gaikwad, A. Ghosh, "Development of Optical Fiber Test Bench for Intensity-Modulated Optical Fiber Sensors", 2020 4th International Conference on Trends in Electronics and Informatics (ICOEI) (48184), IEEE, P. 176-180, June. 2020.
13. H. Bohra, A. Ghosh, "A Review on Different Optimization Techniques for Selecting Optimal Parameters in Microstrip Bandpass Filter Design", International Journal of Advanced Science and Technology, Vo. 28, Issue 14, P. 379-394, Nov. 2019.
14. J. Terdale, A. Ghosh, "An intensity-modulated optical fiber sensor with agarose coating for measurement of refractive index", International Journal of System Assurance Engineering and Management, Springer India, P. 1-7, Nov. 2022.
15. J. J. Patil, A. Ghosh, "Intensity Modulation based U shaped Plastic Optical Fiber Refractive Index Sensor" 2022 6th International Conference on Trends in Electronics and Informatics (ICOEI), IEEE, P. 18-24, Apr. 2022.
16. H. Bohra, A. Ghosh, A. Bhaskar, "Design and Analysis of Spurious Harmonics Suppressed Microstrip Ultrawide Band Filter using Modified Defected Ground Structure Techniques", Wireless Personal Communications, Springer US, Vol. 121, Issue 1, P. 361-380, Nov. 2021.
17. H. Bohra, A. Ghosh, A. Bhaskar, A. Sharma, "A Miniaturized Ultra-Wideband Low-Pass Microstrip Filter Design using Modified Defected Ground Structure Techniques", Invertis University, Vol. 14, Issue 1, P. 25-30, 2021.
18. H. Patidar, P. Chakrabarti, A. Ghosh, "Parallel Computing Aspects in Improved Edge Cover Based Graph Coloring Algorithm", Indian Journal of Science and Technology, Vol. 10, P. 25, Jul. 2017.
19. A. Ghosh, P. Chakrabarti, P. Siano, "Approach towards realizing the Security Threats for Mobile IPv6 and Solution Thereof", International Journal of Computer Applications, Foundation of Computer Science, Vol. 90, Issue 10, Jan. 2014.
20. A. Ghosh, P. Chakrabarti, D. Bhatnagar, "Performance Evaluation of Optimized Mobile IP Protocol Vis-à-vis Bit Map Indexing Method", International Journal of Computer Applications, Foundation of Computer Science, Vol. 75, Issue: 2, Jan. 2013.
21. K Suvarna Vani, Bui Thanh Hung, Prasun Chakrabarti, Tulika Chakrabarti, Ahmed A Elngar, "Detection and Classification of Invasive Ductal Carcinoma using Artificial Intelligence", 2022 (https://doi.org/10.21203/rs.3.rs-2069384/v1)
22. KS Balamurugan, Prasun Chakrabarti, Tulika Chakrabarti, Amit Gupta, Ahmed A Elngar, Mohammad Nami, Vinayakumar Ravi, Grienggrai Rajchakit, M Ali Akbar, "Improving the Performance of Diagnosing Chronic obstructive Lung Disease Using Outlier Detection with Decision Tree Algorithm", Pre-print, 2022 (https://doi.org/10.21203/rs.3.rs-2072803/v2)
23. Ruhul Amin Hazarika, Arnab Kumar Maji, Debdatta Kandar, Prasun Chakrabarti, Tulika Chakrabarti, KS Jagannatha Rao, Jose Carvalho, Babak Kateb, Mohammad Nami, "An evaluation on changes in Hippocampus size for Cognitively Normal (CN), Mild Cognitive Impairment (MCI), and Alzheimer's disease (AD) patients using Fuzzy Membership Function", OSF Preprints, 2021.

e-ISSN : 26203502
p-ISSN : 26153785

24. Jitendra Shreemali, Prasun Chakrabarti, Tulika Chakrabarti, Sandeep Poddar, Daniel Sipple, Babak Kateb, Mohammad Nami, "A Machine Learning Perspective on Causes of Suicides and identification of Vulnerable Categories using Multiple Algorithms", medRxiv, 2021.

25. Papiya Debnath, Pankaj Chittora, Tulika Chakrabarti, Prasun Chakrabarti, Zbigniew Leonowicz, Michal Jasinski , Radomir Gono, Elżbieta Jasińska, "Analysis of earthquake prediction in India using supervised machine learning classifiers", Sustainibility ,13(2):971 , 2021.

26. Pankaj Chittora, Sandeep Chaurasia, Prasun Chakrabarti, Gaurav Kumawat, Tulika Chakrabarti, Zbigniew Leonowiz, Michael Jaisinski, Lukasz Jaisinski, Radomir Gono, Elzbieta Jaisinski, Vadim Bolshev, "Prediction of Chronic Kidney Disease - A Machine Learning perspective", IEEE Access, 9 : 17312-17334,2021

27. Akhilesh Kumar Sharma, Gaurav Aggarwal, Sachit Bhardwaj, Prasun Chakrabarti, Tulika Chakrabarti, Jemal Hussain, Siddhartha Bhattarcharyya, Richa Mishra, Anirban Das, Hairulnizam Mahdin, "Classification of Indian Classical Music with Time-Series Matching using Deep Learning", IEEE Access , 9 : 102041-102052 , 2021 (DOI-10.1109/ACCESS.2021.3093911)

28. Abrar Ahmed Chhipa , Vinod Kumar, R. R. Joshi, Prasun Chakrabarti, Michal Jaisinski, Alessandro Burgio, Zbigniew Leonowicz, Elzbieta Jasinska, Rajkumar Soni, Tulika Chakrabarti, "Adaptive Neuro-fuzzy Inference System Based Maximum Power Tracking Controller for Variable Speed WECS", Energies ,14(19) :6275, 2021 (https://doi.org/10.3390/en14196275)

29. Tulika Chakrabarti, Sibabrata Mukhopadhyay, Prasun Chakrabarti, Gholamreza Hatam, Mohammad Nami, "Phenyl Ethanoid Glycoside from the bark of Oroxylum indicum vent : a potential inhibitor of DNA Topoisomerase IB of Leismania donovani", Journal of Advanced Medical Sciences and Applied Technologies , 2021 (https://doi.org/10.30476/jamsat.2021.91626.1022)

30. Sreemoy Kanti Das, GS Chakraborthy, Tulika Chakrabarti, Prasun Chakrabarti, Mohammad Javad Gholamzadeh, Mohammad Nami, "Evaluation of nootropic activity of standardized Epipremnum aureum extract against scopolamine-induced amnesia in experimental animals", Journal of Advanced Medical Sciences and Applied Technologies , 6(1): 64-71,2021

31. Prasun Chakrabarti , Tulika Chakrabarti , Mayank Sharma. , D Atre D, K.Baba Pai, "Quantification of Thought Analysis of Alcohol-addicted persons and memory loss of patients suffering from stage-4 liver cancer", Advances in Intelligent Systems and Computing, 1053, pp.1099-1105, 2020

32. Prasun Chakrabarti, Tulika Chakrabarti , Biswajit Satpathy, I SenGupta , Jonathan Andrew Ware, "Analysis of strategic market management in the light of stochastic processes, recurrence relation, Abelian group and expectation", Advances in Artificial Intelligence and Data Engineering, 1133 , pp.701-710, 2020

33. Prasun Chakrabarti, Siddhant Bane, Biswajit Satpathy , Mark Goh , B N Datta , Tulika Chakrabarti, "Compound Poisson Process and its Applications in Business", Lecture Notes in Electrical Engineering, 601, pp.678-685,2020

34. Ali-Mohammad Kamali , Milad Kazemiha, Behnam Keshtkarhesamabadi, Mohsan Daneshvari, Asadollah Zarifkar, Prasun Chakrabarti, Babak Kateb, Mohammad Nami "Simultaneous Transcranial and Transcutaneous Spinal Direct Current Stimulation to Enhance Athletic Performance Outcome in Experienced Boxers", Scientific Reports , 11 : 19722, 2021.

e-ISSN : 26203502
p-ISSN : 26153785

35. Xin Wang, Yuhao Zhou, Tingwen Huang, Prasun Chakrabarti , "Event-triggered Adaptive Fault-tolerant Control for a Class of Nonlinear Multiagent Systems with Sensor and Actuator Faults" , IEEE Transactions on Circuits and Systems I: Regular Papers, 2022.

36. Tuan Pham Van, Dung Vo Tien, Zbigniew Leonowicz , Michal Jasiński , Tomasz Sikorski , Prasun Chakrabarti "Online Rotor And Stator Resistance Estimation Based On Artificial Neural Network Applied In Sensorless Induction Motor Drive", Energies , 13 : 4946 , 2020.

37. Imayanmosha Wahlang, Arnab Kumar Maji, Goutam Saha, Prasun Chakrabarti, Michał Jasiński , Zbigniew Leonowicz, Elzbieta Jasinska , "Deep Learning methods for classification of certain abnormalities in Echocardiography", Electronics , 10 : 495., 2021.

38. Rajkumar Soni , Prasun Chakrabarti , Zbigniew Leonowicz , Michal Jasinski , Krzysztof Wieczorek , Vadim Bolshev, "Estimation of Life Cycle of Distribution Transformer in Context to Furan Content Formation , Pollution Index and Dielectric Strength", IEEE Access, 9 : 37456, 2021.

39. Yogendra Singh Solanki, Prasun Chakrabarti, Michal Jasinski , Zbigniew Leonowicz, Vadim Bolshev , Alexander Vinogradov, Elzbieta Jasinska, Radomir Gono, Mohammad Nami , "A Hybrid Supervised Machine Learning Classifier System for Breast Cancer Prognosis Using Feature Selection and Data Imbalance Handling Approaches", Electronics ,10(6) : 699, 2021.

40. Siddhartha Bhattacharyya, Tulika Dutta, Sandip Dey, Somnath Mukhopadhayay, Prasun Chakrabarti , "Hyperspectral Multi-level Image Thresholding using Qutrit Genetic Algorithm Expert Systems With Applications", Expert Systems with Applications, 181 : 115107, 2021.

41. Sergey Senkevich, Vadim Bolshev, Ekaterina Ilchenko, Prasun Chakrabarti, Michał Jasiński, Zbigniew Leonowicz , Mikhail Chaplygin, "Elastic Damping Mechanism Optimization by Indefinite Lagrange Multipliers", IEEE Access,9 :71784,2021.

42. Tapan Behl, Anuja Singh ,Aayush Sehgal ,Sukhbir Singh , Neelam Sharma, Tanveer Naved, Saurabh Bhatia, Ahmed Al-Harrasi, Prasun Chakrabarti, Lotfi Aleya,Simona Bungau "Mechanistic Insights into the Role of B Cells in Rheumatoid Arthritis", International Immunopharmacology, 99 : 108078 , 2021.

43. Zuhaib Ashfaq Khan, Hafiz Husnain Raza Sherazi , Mubashir Ali, Muhammad Ali Imran, Ikram Ur Rehman, Prasun Chakrabarti , "Designing Wind Energy Harvester for Connected Vehicles in Green Cities", Energies , 14(17) :5408, 2021.

44. M A Berlin , N Upadhayaya, A Alghatani, V Tirth, S Islam, K Murali, P R Kshirsagar, Bui Thanh Hung, Prasun Chakrabarti , Pankaj Dadheech , "Novel hybrid artificial intelligence based algorithm to determine the effects of air pollution on human electroencephalogram signals", Journal of Environmental Protection and Ecology , 22(5): 1825-1835,2021.

45. M Abul Hasan, K Raghuveer, P S Pandey, Ashok Kumar, Ashim Bora, Deepa Jose, P R Kshirsagar, Bui Thanh Hung, Prasun Chakrabarti , M M Khanapurkar , "Internet of Things and its applications in Industry 4.0 for Smart Waste Management", Journal of Environmental Protection and Ecology , 22(6): 2368-2378,2021.

46. Vivek Jain, Prasun Chakrabarti , Massimo Mitolo , Zbigniew Leonowicz, Michal Jasinski , Alexander Vinogradov, , Vadim Bolshev , "A Power-Efficient Multichannel Low-Pass Filter Based on the Cascaded Multiple Accumulate Finite Impulse Response (CMFIR) Structure for Digital Image Processing", Circuits, Systems and Signal Processing , 2022 (http://doi.org/10.1007/s00034-022-01960-5).

47. Tanima Bhattacharya, Debashrita Das, Giselle A. Borges e Soares, Prasun Chakrabarti, Zhaoquan Ai, Hitesh Chopra, Alexandru Madalin Hasan , Simona Cavalu , "Novel Green

e-ISSN : 26203502
p-ISSN : 26153785

Approaches for the Preparation of Gold Nanoparticles and Their Promising Potential in Oncology", Processes , 10(2) : 426, 2022

48. Imayanmosha Wahlang, Arnab Kumar Maji , Goutam Saha, Prasun Chakrabarti, Michal Jasinski , Zbigniew Leonowicz, Elzbieta Jasinska , "Brain Magnetic Resonance Imaging Classification using Deep Learning Architectures with gender and age" , Sensors , 22 :1766, 2022.

49. S. Hemalatha, Pravin R. Kshirsagar, Hariprasath Manoharan, N. Vasantha Gowri, A. Vani, Sana Qaiyum, P. Vijayakumar, Vineet Tirth,Sulaima Lebbe Abdul Haleem, Prasun Chakrabarti and Dawit Mamiru Teressa "Novel Link Establishment Communication Scheme against Selfish Attack Using Node Reward with Trust Level Evaluation Algorithm in MANET" ,Wireless Communications and Mobile Computing , 2022.

50. M Vasaghi , S Z Mousavi, M Owrangi, M Zadeh, Ali Kamali, Mehdi Dehghani, Prasun Chakrabarti, Mohammad Nami , "Neural Correlates in Functional Brain Mapping among Breast Cancer Survivors Receiving Different Chemotherapy Regimens; a qEEG/HEG – based Investigation", Japanese Journal of Clinical Oncology, 2022.

51. Maryam Owrangi, Mohammad Javad Gholamzadeh, Maryam Vasaghi Gharamaleki, Seyedeh Zahra Mousavi, Ali-Mohammad Kamali, Mehdi Dehghani, Prasun Chakrabarti , Mohammad Nami , "Comparative analysis of the chemotherapy-related cognitive impairments in patients with breast cancer: a community-based research", Cancer Investigation,2022.

52. Hariprasath Manoharan, Radha Krishna Rambola, Pravin R. Kshirsagar, Prasun Chakrabarti, Jarallah Alqahtani, Quadri Noorulhasan Naveed, Saiful Islam, Walelign Dinku Mekuriyaw, "Aerial Separation and Receiver Arrangements on Identifying Lung Syndromes Using the Artificial Neural Network", Computational Intelligence and Neuroscience, 2022.

53. Negin Farhadian , Alireza Moradi , Mohammad Nami , Kamran Kazemi , Mohammad Rasoul Ghadami , Alireza Ahmadi , Reza Mohammadi , Mohammad Naseh Talebi , Prasun Chakrabarti , Babak Kateb , Habibolah Khazaie , "The nexus between sleep disturbances and mental health outcomes in military staff – a systematic review", Sleep Science , 15(3),2022 (DOI: 10.5935/1984-0063.20220816)

54. Viktor, P., & Szeghegyi, Á. (2022). Safety of the Introduction of Self-driving Vehicles in a Logistics Environment. Periodica Polytechnica Transportation Engineering, 50(4), 387–399. http://doi.org/10.3311/PPtr.20006

55. Viktor, P., & Reicher, R. (2020). Magyarországi leányvállalatok centralizált beszerzései. Logisztikai Trendek És Legjobb Gyakorlatok, 6(2), 35–44. http://doi.org/10.21405/logtrend.2020.6.2.35

56. Viktor, P., Molnár, A., & Fodor, M. (2022). The Current State of Vocational Schools in Hungary and New Strategies in Teaching. Specialusis Ugdymas, 2(43), 3497–3515.

57. Albert, M., Patrik, V., Dániel, S., & Ágnes, C.-K. (2021). Frequency analysis of anomalous negative price fluctuations in stock market indices as a crisis forecasting tool. Macrotheme Review: A Multidisciplinary Journal Of Global Macro Trends, 10(1), 9–26.

58. Patrik, V. (2021). Conditions for the introduction of autonomous vehicles. Macrotheme Review: A Multidisciplinary Journal Of Global Macro Trends, 10(1), 77–85.

59. Patrik, V., Albert, M., Claudia, C., & Mónika, G.-F. (2021). Consumer habits of purchasing food products, grown in Hungary. Macrotheme Review: A Multidisciplinary Journal Of Global Macro Trends, 10(1), 27–39.

60. Dániel, S., & Patrik, V. (2021). The importance of project risk management in practice. Macrotheme Review: A Multidisciplinary Journal Of Global Macro Trends, 10(1), 68–76.

e-ISSN : 26203502
p-ISSN : 26153785

61. Mónika, F., & Patrik, V. (2022). IOT devices and 5G network security option from generation aspects. In IEEE 10th Jubilee International Conference on Computational Cybernetics and Cyber-Medical Systems ICCC 2022 (pp. 265–269).

62. Szeghegyi, Á., & Viktor, P. (2022). Impact of the Energy Crisis on Demand for Plug-in Hybrid Vehicles. In IEEE Joint 22nd International Symposium on Computational Intelligence and Informatics and 8th International Conference on Recent Achievements in Mechatronics, Automation, Computer Science and Robotics (CINTI-MACRo 2022) (pp. 215–219).

63. Patrik, V., Dániel, S., & Albert, M. (2021). Consumer habits and autonomous vehicles. In FIKUSZ 2021 XVI. International Conference Proceedings (pp. 73–81).

64. Haq, M. A., Baral, P., Yaragal, S. & Rahaman, G. Assessment of trends of land surface vegetation distribution, snow cover and temperature over entire Himachal Pradesh using MODIS datasets. Nat. Resour. Model. 33, (2020).

65. Haq, M. A., Rahaman, G., Baral, P. & Ghosh, A. Deep Learning Based Supervised Image Classification Using UAV Images for Forest Areas Classification. J. Indian Soc. Remote Sensing. 49, 601–606 (2020).

66. Baral, P. & Haq, M. A. Spatial prediction of permafrost occurrence in Sikkim Himalayas using logistic regression, random forests, support vector machines and neural networks. Geomorphology 371, 107331 (2020).

67. S.Vasanthakumari ,"Soft skills and its application in work place," World Journal of Advanced Research and Reviews,vol. 03, no.02,p.66–72,2019.

68. S.Vasanthakumari , "Correlation of Psychological Stress and Nutritional status in HIV Infected children residing in selected residential home," Indian Journal of Advanced Nursing, vol. I, no. II,p.8-18,2015.

69. S.Vasanthakumari , "Effectiveness of play therapy in promoting socialization among the Mentally Challenged Children," TNNMC JPN,vol. II, no. 1,p.4-7,2014.

70. S.Vasanthakumari , Bizuneh Wakuma ," Nomophobia – Smartphone Addiction," CCNE Digest,vol. 7, no.1,p. 1-4,2019.

71. S.Vasanthakumari ," Effectiveness of stress reduction technique on the level of stress among HIV infected children," The Journal of Nursing Trendz ,vol. VII, no.01,p. 10-15,2016.

72. Amit Kumar Jain, "Overview of Serverless Architecture," International Journal of Engineering Research & Technology, vol. 11, no. 09, p. 3, 2022.

73. Amit Kumar Jain, "Multi-Cloud Computing & Why do we need to Embrace it," International Journal Of Engineering Research & Technology, vol. 11, no. 09, p. 1, 2022.

74. Amit Kumar Jain, "Hybrid Cloud Computing: A Perspective," International Journal of Engineering Research & Technology, vol. 11, no. 10, p. 1, 2022.

75. Al-Awawdeh, N., & Kalsoom, T. (2022). Foreign Languages E-Learning Assessment Efficiency and Content Access Effectiveness During Corona Pandemic in University Context. Theory and Practice in Language Studies, 12(10), 2124-2132.

76. Alawawdeh, N. Alshtaiwi, M. (2020). Foreign Languages E-Learning: Challenges, Obstacles and Behaviours during COVID-19 Pandemic in Jordan.. PalArch's Journal of Archaeology of Egypt / Egyptology, 17 (6), 11536-11554.

77. Al-Awawdeh, N. (2021). Translation Between Creativity and Reproducing An Equivalent Original Text. Psychology and Education Journal, 58 (1), 2559-2564.

e-ISSN : 26203502
p-ISSN : 26153785

78. Al-Awawdeh,N. (2022). The Function Of Ideology In Translation: A Case Study Of Selected Aljazeera News Headlines Translated Into Arabic. Ijaz Arabi Journal of Arabic Learning, 5 (1), 48-58.

79. Kalsoom, T., Aziz, F. & Al-Awawdeh, N. (2021). Foreign Language Learning Anxiety: A Systematic Literature Review. TESOL International Journal: English Language Education Publishing, 16 (4.3), 239-252.

80. H. Nayak, A, Kushwaha, P.C. Behera, N.C. Shahi, K.P.S. Kushwaha, A. Kumar and K.K. Mishra, "The pink oyster mushroom, Pleurotus djamor (Agaricomycetes): A potent antioxidant and hypoglycemic agent," International Journal of Medicinal Mushrooms, vol. 23, no. 12, p. 29-36, 2021.

81. O. M. Abo-Seida, N. T. M. El-dabe, A. Refaie Ali and G. A. Shalaby, "Cherenkov FEL Reaction with Plasma-Filled Cylindrical Waveguide in Fractional D-Dimensional Space" IEEE Transactions on Plasma Science, vol. 49, no. 7, pp. 2070-2079, July 2021.

82. Nabil T. M. El-dabe, A. Refaie Ali, A. A. El-shekhipy, and G. A. Shalaby, "Non-Linear Heat and Mass Transfer of Second Grade Fluid Flow with Hall Currents and Thermophoresis Effects", Applied Mathematics & Information Sciences (AMIS), vol. 11, no. 1, pp. 267-280, 2017.

83. N.T.M.El-Dabe, A.Refaie Ali, and A.A.El-shekhipy, "Influence of Thermophoresis on Unsteady MHD Flow of Radiation Absorbing Kuvshinski Fluid with Non-Linear Heat and Mass Transfer", Columbia International Publishing American Journal of Heat and Mass Transfer 2017.

84. Sunil Devidas Bobade, Nita S. patil , Sanjay M. Patil , Ajay Reddy Yeruva , Parth M. Pandya5 , Ahmed Refaie Ali, "Efficient Deterministic Approach for Coverage Hole Detection In Wireless Sensor Underground Network: Mathematical And Stimulation Model", Journal of Pharmaceutical Negative Results, vo;.13, Special Issue9, 2022.

85. Osama M. Abo-Seida , N.T.M.Eldabe , A.Refaie Ali , G. A. Shalaby, "Far-Field, Radiation Resistance and temperature of Hertzian Dipole Antenna in Lossless Medium with Momentum and Energy Flow in the Far- Zone", Journal of Advances in Physics, vol. 18: pp. 2347-3487, 2020.

86. Osama M. Abo-Seida, N.T.M.Eldabe, M. Abu-Shady, A.Refaie Ali, "Electromagnetic non-Darcy Forchheimer flow and heat transfer over a nonlinearly stretching sheet of non-Newtonian fluid in the presence of a non-uniform heat source", Solid State Technology, vol. 63, no. 6, 2020.

87. Abo-Seida, Osama M., N. T. M. Eldabe, and Ahmed Refaie Ali. "Gamil. Ali Shalaby, " Far-Field, Radiation Resistance and temperature of Hertzian Dipole Antenna in Lossless Medium with Momentum and Energy Flow in the Far-Zone" Journal of Advances in Physics , vol. 18, pp 20-28, 2020.

88. SS Priscila, M Hemalatha, "Improving the performance of entropy ensembles of neural networks (EENNS) on classification of heart disease prediction", Int J Pure Appl Math 117 (7), 371-386, 2017.

89. S Silvia Priscila, M Hemalatha, " Diagnosisof heart disease with particle bee-neural network" Biomedical Research, Special Issue, pp. S40-S46, 2018.

90. S Silvia Priscila, M Hemalatha, " Heart Disease Prediction Using Integer-Coded Genetic Algorithm (ICGA) Based Particle Clonal Neural Network (ICGA-PCNN)", Bonfring International Journal of Industrial Engineering and Management Science 8 (2), 15-19, 2018.

e-ISSN : 26203502
p-ISSN : 26153785

91. Tadiboina, S. N., & Kumar, S. (2019). Treatment Policies For Chronic Illnesses And The Potential To Transform Health Care With Artificial Intelligence. Ilkogretim Online, 18(1), 610-619.

92. Tadiboina, S. N. (2022). The Use Of AI In Advanced Medical Imaging. Journal of Positive School Psychology, 6(11), 1939-1946.

93. Tadiboina, S. N., & Liu, W. (2022). Artificial Intelligence (AI) And Deep Learning (DL) In Medical Diagnosis Process Such As SPECT And PET. Journal of Positive School Psychology, 6(8), 10665-10673.

94. Tadiboina, S. N. (2022). The Integration Of Handheld And Smartphone-Connected Technologies Into The Doctor-Patient Relationship-AI. Journal of Positive School Psychology, 6(11), 2933-2940.

95. AbdulKader, H., ElAbd, E., & Ead, W. (2016). Protecting Online Social Networks Profiles by Hiding Sensitive Data Attributes. Procedia Computer Science, 82, 20–27.

96. Fattoh, I. E., Kamal Alsheref, F., Ead, W. M., & Youssef, A. M. (2022). Semantic sentiment classification for covid-19 tweets using universal sentence encoder. Computational Intelligence and Neuroscience, 2022, 1–8.

97. Ead, W. M., Abdel-Wahed, W. F., & Abdul-Kader, H. (2013). Adaptive Fuzzy Classification-Rule Algorithm In Detection Malicious Web Sites From Suspicious URLs. Int. Arab. J. E Technol., 3, 1–9.

98. Abdelazim, M. A., Nasr, M. M., & Ead, W. M. (2020). A survey on classification analysis for cancer genomics: Limitations and novel opportunity in the era of cancer classification and Target Therapies. Annals of Tropical Medicine and Public Health, 23(24).

99. Alsheref, F. K., Fattoh, I. E., & M.Ead, W. (2022). Automated prediction of employee attrition using ensemble model based on machine learning algorithms. Computational Intelligence and Neuroscience, 2022, 1–9.

100. Saraswat, Surbhi. (2018). Myth & Gender: A Critical Reading of Chitra Banerjee Devakaruni's Before We Visit the Goddess, IJELLH, vol.VI, Issue II, pp. 748-754

101. Saraswat, S. (2018). Rape & Body Politics: Gender Violence in Manjula Padmanaban's Lights Out. RJELAL, 6(1), 415-421.

102. Saraswat, S. (2022). Urban Materiality and Social Change: Mapping the Urban Reality in Mahesh Dattani's. The Big Fat City. ECS Transactions, 107(1), 13701.

103. Saraswat, S. (2021). Writing Wrongs: Mahesh Dattani's Thirty Days in September as a Trauma Narrative. Turkish Online Journal of Qualitative Inquiry, 12(3).

104. Saraswat, S. (2020). Representation of Emerging Technologies: Postmodern Urban Dystopia in Manjula Padmanabhan's Harvest. International Journal on Emerging Technologies, 11(4): 446–449.

105. Otto, L., & Lumapenet, H. (2022). Technological Leadership and Crisis Management Skills of the School Administrators Towards School Development in the Special Geographical Area of MBHTE-BARMM. International Journal of Advance Research and Innovative Ideas In Education, 8(3), 3934-3937.

106. Pagocag, H. K., & Lumapenet, H. T. Teachers' work Stressors Towards Achievement and Learners' performance. International Journal Of Advance Research And Innovative Ideas In Education, 8(3), 5526-5530.

107. Lumapenet, H., & Usop, M. (2022). School Readiness towards the Delivery of Learning in the New Normal. International Journal of Early Childhood Special Education (INT-JECSE), 14(03), 2629-2637.

e-ISSN : 26203502
p-ISSN : 26153785

108. Santander, E. B., & Lumapenet, H. T. Mediating Effect of Coping Strategies on The Relationship Between Occupational Stress And Quality Of Life Among Elementary School. Stress, 7(8), 9.

109. Tiago, N. A., & Lumapenet, H. T. Teachers' challenges And Adjustments Towards Their Performance in The New Normal.

110. Calud, C., Dalandangan, P., & Lumapenet, H. (2022). Schools' Health Measure on Limited Face-To-Face Classes and Pupils' Well-Being. International Journal of Advance Research and Innovative Ideas in Education, 8(3), 5021-5028.

111. Von Louie, A. S., Lumapenet, H. T., & Mamburao Jr, R. S. Leadership and Fiscal Management Skills Among Publec Elementary School Principals In Southern Philippines

112. Guiamalon, T., Alon, S. A., & Camsa, S. (2021). Teachers Issues and Concerns on the Use of Modular Learning Modality‖, IJASOS-International E-Journal of Advances in Social Sciences, Vol.

113. Guiamalon, T. S., & Hariraya, P. G. (2021). The K-12 Senior High School Programl: The Case of Laboratory High School, Cotabato City State Polytechnic College, South Central Mindanao, Philippines. IJASOS-International E-journal of Advances in Social Sciences, 7(19), 391-399.

114. Guiamalon, T. (2021). Parental Interventions Towards Learners' mental Health in Times of The Covid 19 Pandemic. IJAEDU-International E-Journal of Advances in Education, 7(20), 90-99.

115. Guiamalon, T. S. (2021). Graduate Education Programs: Its Relation to Graduates Work Competencies in The Workplace. IJAEDU-International E-Journal of Advances in Education, 7(19), 58-66.

116. Guiamalon, T., Elias, S., & Boquia, A. (2022). University Status Assessment: A Baseline Study. IJASOS-International E-journal of Advances in Social Sciences, 8(23), 468-478.

117. Dilna, A., Guiamalon, T., Dilna, S. (2022). Teachers' Adaptation and Practices Amidst Pandemic. IJASOS-International E-journal of Advances in Social Sciences, 8(23), 456-467.

118. Guiamalon, T., Lumapenet, H., Katog, M., & Dilna, S. (2022). Coping with COVID-19: How Public Secondary School Principals Adapt to the New Normal? Guiamalon, TS, Lumapenet, HT (2022). Coping with COVID-19: How Public Secondary School Principals Adapt to the New Normal, 2363-2367.

119. Lumapenet, H. (2017). Determinants of Bangsamoro Teacher's Identity. In Lumapenet, HT, & Sagadan, SA Determinants of Bangsamoro Teacher's Identity. 7th CEBU International Conference on Civil, Agricultural, Biological and Environmental Sciences (CABES-17) Sept (pp. 21-22).

120. Al-Abyadh, Mohammed Hasan Ali, and Hani Abdel Hafeez Abdel Azeem. (2022). "Academic Achievement: Influences of University Students' Self-Management and Perceived Self-Efficacy" Journal of Intelligence 10, no. 3: 55.

121. Abdel Azeem, H.A.H. and Al-Abyadh, M.H.A. (2021), "Self-compassion: the influences on the university students' life satisfaction during the COVID-19 outbreak", International Journal of Human Rights in Healthcare, https://doi.org/10.1108/IJHRH-08-2021-0153

122. Al-Abrat N.A.S., Alabyad M.H.A. (2021) The Extent of Awareness of Faculty Members at Al-bayda University About the Concept of Educational Technology and Their Attitudes Towards It. In: Al-Bakry A.M. et al. (eds) New Trends in Information and Communications Technology Applications. NTICT 2021. Communications in Computer and Information Science, vol 1511. Springer, Cham.

e-ISSN : 26203502
p-ISSN : 26153785

123. ldbyani, A., & Al-Abyadh, M. H. A. (2022). Relationship between Dark Triad, Mental Health, and Subjective Well-being Moderated by Mindfulness: A Study on Atheists and Muslim Students. Islamic Guidance and Counseling Journal, 5(1), 71–87.

124. Kem D. (2022), "Strengthening Online Education: Challenges and Opportunities in India", International Journal of Humanities and Social Science Invention, vol. 11 (05), 2022, pp 01-12.

125. Kem D. (2022) "Personalised and Adaptive Learning: Emerging Learning Platforms in the Era of Digital and Smart Learning", International Journal of Social Science and Human Research, vol. 5 (2), pp. 385-391.

126. Kem D. (2021) "Social Inclusion through Skill Development in India", International Journal of Creative Research Thoughts, vol. 9 (10), pp. a 550-a558.

127. Kem D. (2021) 'New Media Democracy: Expressions and Propaganda' International Research Journal of Management Sociology and Humanities, vol. 12 (5), pp. 193-200.

128. Kem D. (2021) "A Socio-Psychological Analysis of The Effects Of Digital Gaming On Teenagers", Elementary Education Online, vol. 20 (6), 3660-3666.

129. M. Farman, A. Akgül, M.T. Tekin, M. M. Akram, A. Aqeel , E. E. Mahmoud, I. S. Yahia, "Fractal fractional-order derivative for HIV/AIDS model with Mittag-Leffler kernel", Alex. Eng. J, vol. 61, no. 12,pp. 10965-10980, April 2022.

130. K.S. Nisar, A. Aqeel, M. Inc, M. Farman, H. Rezazadeh, L. Akinyemi, M.M. Mannan, "Analysis of dengue transmission using fractional order scheme", Aims Math, vol. 7 no. 5, pp. 8408–8429, May 2022.

131. M.M. Akram, M. Farman, A. Akgül, M. U. Saleem, A. Ahmad, M. Partohaghigh, F. Jarad, "Analysis of HIV/AIDS model with Mittag-Leffler kernel", Aims Math, vol. 7 no. 7, pp. 13383-13401, July 2022.

132. Jain, Rituraj, Chakravarthi, M. Kalyan, Kumar, P. K., Hemakesavulu, O., Ramirez-Asis, Edwin, Pelaez-Diaz, Guillermo and Mahaveerakannan, R.. "Internet of Things-based smart vehicles design of bio-inspired algorithms using artificial intelligence charging system" Nonlinear Engineering, vol. 11, no. 1, pp. 582-589, 2022.

133. Pradeep Reddy, Gogulamudi, Yellapragada Venkata Pavan Kumar, Maddikera Kalyan Chakravarthi, and Aymen Flah., "Refined Network Topology for Improved Reliability and Enhanced Dijkstra Algorithm for Optimal Path Selection during Link Failures in Cluster Microgrids" Sustainability 14, no. 16: 10367, 2022.

134. Reddy, Gogulamudi Pradeep, Yellapragada Venkata Pavan Kumar, and Maddikera Kalyan Chakravarthi., "Communication Technologies for Interoperable Smart Microgrids in Urban Energy Community: A Broad Review of the State of the Art, Challenges, and Research Perspectives" Sensors 22, no. 15: 5881. 2022.

135. C. R. Mahesha, R. Suprabha, Nellore Manoj Kumar, Koushik Kosanam, Harishchander Anandaram, S. C. V. Ramana Murty Naidu, M. Kalyan Chakravarthi, Venkatesan Govindarajan, "Effect of Friction Stir Welding on the Mechanical and Microstructural Behaviour of AA7075 Aluminium Alloy", Advances in Materials Science and Engineering, vol. 2022, 8 pages, 2022.

136. B. Deepa, K. Gayathiridevi, M. Kalyan Chakravarthi, A. Shajahan, B Shanti Sree, Mohammed Imran Anees, Mohammad Habeeb, "Slow evaporation technique to grow 3 – Amino benzene sulfonic acid single crystal for Non-Linear optical (NLO) transmission", Materials Today: Proceedings, Vol. 62, Part.4, pp.2119-2123, 2022.

e-ISSN : 26203502
p-ISSN : 26153785

137. A, V. V. ., T, S. ., S, S. N. ., & Rajest, D. S. S. . (2022). IoT-Based Automated Oxygen Pumping System for Acute Asthma Patients. European Journal of Life Safety and Stability (2660-9630), 19 (7), 8-34.

138. Regin, D. R., Rajest, D. S. S., T, S., G, J. A. C., & R, S. (2022). An Automated Conversation System Using Natural Language Processing (NLP) Chatbot in Python. Central Asian Journal Of Medical And Natural Sciences, 3(4), 314-336.

139. Rajest, S. S. ., Regin, R. ., T, S. ., G, J. A. C. ., & R, S. . (2022). Production of Blockchains as Well as their Implementation. Vital Annex : International Journal of Novel Research in Advanced Sciences, 1(2), 21–44.

140. T, S., Rajest, S. S., Regin, R., Christabel G, J. A., & R, S. (2022). Automation And Control Of Industrial Operations Using Android Mobile Devices Based On The Internet Of Things. Central Asian Journal of Mathematical Theory and Computer Sciences, 3(9), 1-33.

141. Jerusha Angelene Christabel G, Shynu T, S. Suman Rajest, R. Regin, & Steffi. R. (2022). The use of Internet of Things (Iot) Technology in the Context of "Smart Gardens" is Becoming Increasingly Popular. International Journal of Biological Engineering and Agriculture, 1(2), 1–13.

142. R. Regin, Steffi. R, Jerusha Angelene Christabel G, Shynu T, S. Suman Rajest (2022), "Internet of Things (IoT) System Using Interrelated Computing Devices in Billing System", Journal of Advanced Research in Dynamical and Control Systems, Vol.14, no.1, pp. 24-40.

143. S. S. Rajest, R. Regin, S. T, J. A. C. G, and S. R, "Improving Infrastructure and Transportation Systems Using Internet of Things Based Smart City", CAJOTAS, vol. 3, no. 9, pp. 125-141, Sep. 2022.

144. R, S., Rajest, S. S., Regin, R., & T, S. (2022). The Obstacles Facing Businesses that are Run by their Families as their Primary Owners. Central Asian Journal of Innovations on Tourism Management and Finance, 3(11), 145-163.

145. Priscila, S. S., Rajest, S. S., T, S. and G, G. (2022) "An Improvised Virtual Queue Algorithm to Manipulate the Congestion in High-Speed Network", Central Asian Journal of Medical and Natural Science, 3(6), pp. 343-360.

146. Regin, R., Rajest, S. S., T, S., & R, S. (2023). Human Resource Perspective and Pitfalls at Work. Central Asian Journal of Innovations on Tourism Management and Finance, 4(1), 31-49.

147. Regin, R., Rajest, S. S., T, S., & R, S. (2023). An Analytical Study of Development in Response to the COVID-19 Pandemic. Central Asian Journal of Medical and Natural Science, 4(1), 199-216.

148. Regin, R., Rajest, S. S., T, S., & R, S. (2023). A Review of Secure Neural Networks and Big Data Mining Applications in Financial Risk Assessment. Central Asian Journal of Innovations on Tourism Management and Finance, 4(2), 73-90.

149. R, S., Rajest, S. S., Regin, R., & T, S. (2023). Family Governance and the Moral Obligation of Businesses to Serve Their Communities. International Journal on Orange Technologies, 5(2), 60-77.

150. T, S., Rajest, S. S., Regin, R., & R, S. (2023). A Review on Using Machine Learning to Conduct Facial Analysis in Real Time for Real-Time Profiling. International Journal of Human Computing Studies, 5(2), 18-37.

151. A.Afroos Banu, S.Mani Naidu, Vinjamuri S.N. Ch.Dattu, G.Sridevi, M.Kalyan Chakravarthi, N.R.Rajagopalan," Experimentally investigating the influence of static

e-ISSN : 26203502
p-ISSN : 26153785

mixers on the performance of a solar water heater", Materials Today: Proceedings, Vol. 62, Part. 4, pp. 2370-2375, 2022.

152. M. Siva Ramkumar, R. Priya, R. Felshiya Rajakumari, Prajoona Valsalan, M. Kalyan Chakravarthi, G. Charlyn Pushpa Latha, S. Mathupriya, Kavitha Rajan, "Review and Evaluation of Power Devices and Semiconductor Materials Based on Si, SiC, and Ga-N", Journal of Nanomaterials, vol. 2022, 7 pages, 2022.
153. S. Gowtham, T.Ch. Anil Kumar, N. S. M. P. Latha Devi, M. Kalyan Chakravarthi, S. Pradeep Kumar, R. Karthik, Harishchander Anandaram, N. Manoj Kumar, Kiran Ramaswamy, "A Survey on Additively Manufactured Nanocomposite Biomaterial for Orthopaedic Applications", Journal of Nanomaterials, vol. 2022, 7 pages, 2022.
154. Buragadda, S., Rani, K.S., Vasantha, S.V., Chakravarthi, M.K.,"HCUGAN: Hybrid Cyclic UNET GAN for Generating Augmented Synthetic Images of Chest X-Ray Images for Multi Classification of Lung Diseases", International Journal of Engineering Trends and Technology, 70(2), pp. 229-238, 2022.
155. M.Kalyan Chakravarthi, Nithya Venkatesan,"Experimental Transfer Function Based Multi-Loop Adaptive Shinskey PI Control For High Dimensional MIMO Systems", Journal of Engineering Science and Technology, 16(5), pp.4006-4015, 2021.
156. M.Kalyan Chakravarthi, Nithya Venkatesan, "Adaptive type-2 fuzzy controller for nonlinear delay dominant MIMO systems: an experimental paradigm in LabVIEW", International Journal of Advanced Intelligence Paradigms, 10(4), pp.354 – 373, 2018.
157. A, Vishwanathraddi, Chakravarthi M., Kalyan ,"Arduino-based wireless mobot", Asian Journal of Pharmaceutical and Clinical Research, 10(13), pp.61–65, 2017.
158. M.Kalyan Chakravarthi, Nithya Venkatesan, "Implementation of a Multi user Secured Remote Data Logger for Real Time Hybrid System", Indian Journal of Science and Technology, 9(35), 2016.
159. Jolly, Anu Rose, Chakravarthi, M Kalyan, Jindal, Naveen Kumar, Birla sekaran, Dinesh," Transparent Proxy Cache server using Raspberry Pi", Indian Journal of Science and Technology, 9(44), 2016.
160. M.Kalyan Chakravarthi, Nithya Venkatesan, 2015," Design and Implementation of LabVIEW Based Optimally Tuned PI Controller for A Real Time Non Linear Process", Asian Journal of Scientific Research, Vol.8, Number 1, pp.95-106.
161. M. Kalyan Chakravarthi ,B.Bharath."Dip Coated Thick Films Of Zno And Its Ethanol Sensing Properties", IEEE, International Symposium on Mechatronics and its Applications (ISMA12), Sharjah, UAE,Pages:1-5, 2012.
162. M. Kalyan Chakravarthi, Pramod R. Watekar, "Optimization of Silica Glass Micro Fiber for Zero Dispersion Wavelength", IJCA, ISBN: 978-93-80866-72-9, National Conference on Innovative Paradigms in Engineering & Technology (NCIPET-2012) organized by S. B. Jain Institute of technology, Nagpur.
163. M. Kalyan Chakravarthi ,K.Charan thej, R.Arun Praveen, M.Anjith and Pramod R. Watekar, " Analysis of Silica Glass Coreless Optical Fiber", National Conference on emerging trends in communications &Signal Processing Techniques,SANKETA-2012,Journal of innovation in electronics and communication,Volume 2,Issue 2,pages:135-137.
164. M., M., & Mesbah, S. (2016). Effective e-government and citizens adoption in Egypt. International Journal of Computer Applications, 133(7), 7–13. https://doi.org/10.5120/ijca2016907886

e-ISSN : 26203502
p-ISSN : 26153785

165. Ead, W. M., & Abbassy, M. M. (2021). IOT based on plant diseases detection and classification. 2021 7th International Conference on Advanced Computing and Communication Systems (ICACCS).

166. Ead, W., & Abbassy, M. (2018). Intelligent Systems of Machine Learning Approaches for developing E-services portals. EAI Endorsed Transactions on Energy Web, 167292. https://doi.org/10.4108/eai.2-12-2020.167292

167. Sadek, R. A., Abd-alazeem, D. M., & Abbassy, M. M. (2021). A new energy-efficient multi-hop routing protocol for heterogeneous wireless sensor networks. International Journal of Advanced Computer Science and Applications, 12(11).

168. Derindere Köseoğlu, S., Ead, W. M., & Abbassy, M. M. (2022). Basics of Financial Data Analytics. Financial Data Analytics, 23–57. https://doi.org/10.1007/978-3-030-83799-0_2

169. Ead, W. M., & Abbassy, M. M. (2022). A general cyber hygiene approach for financial analytical environment. Financial Data Analytics, 369–384.

170. Abbassy, M. M., & Ead, W. M. (2020). Intelligent Greenhouse Management System. 2020 6th International Conference on Advanced Computing and Communication Systems (ICACCS).

171. Khalifa, I., Abd Al-glil, H., & M. Abbassy, M. (2013). Mobile hospitalization. International Journal of Computer Applications, 80(13), 18–23.

172. Abbassy,M.M., & Mohamed A.A.(2016). "Mobile Expert System to Detect Liver Disease Kind", International Journal of Computer Applications, 14(5), 320–324.

173. Khalifa, I., Abd Al-glil, H., & M. Abbassy, M. (2014). Mobile hospitalization for Kidney Transplantation. International Journal of Computer Applications, 92(6), 25–29.

174. Ead, W. M., Abbassy, M. M., & El-Abd, E. (2021). A general framework information loss of utility-based anonymization in Data Publishing. Turkish Journal of Computer and Mathematics Education, 12(5), 1450–1456.

175. Abbassy, M. M., & Abo-Alnadr, A. (2019). Rule-based emotion AI in Arabic Customer Review. International Journal of Advanced Computer Science and Applications, 10(9).

176. Abbassy, M. M. (2020). The human brain signal detection of Health Information System IN EDSAC: A novel cipher text attribute based encryption with EDSAC distributed storage access control. Journal of Advanced Research in Dynamical and Control Systems, 12(SP7), 858–868. https://doi.org/10.5373/jardcs/v12sp7/20202176

177. Abbassy, M. M. (2020). Opinion mining for Arabic customer feedback using machine learning. Journal of Advanced Research in Dynamical and Control Systems, 12(SP3), 209–217.

178. M. Kalyan Chakravarthi ,Rohit Kumar Oli, and Pramod R. Watekar,,"Design of a Furnace for Soft Glass Fiber Drawing", National Conference on emerging trends in communications &Signal Processing echniques,SANKETA-2012, Journal of innovation in electronics and communication,ISSN:2249-9946,Volume 2,Issue 2,pp:178-179.

179. Lohith Ujjaniya, M.Kalyan Chakravarthi, "Raspberry - Pi based cost effective vehicle collision avoidance system using image processing", ARPN Journal of Engineering and Applied Sciences, 10(7), April 2015.pp.3001-3005.